TECHNICAL SUPPORT DOCUMENT
FOR ON-ROAD MOBILE SOURCES:
PM_{10} SIP EMISSIONS INVENTORY
FOR 2011 BASELINE YEAR AND PROJECTION YEARS 2019, 2024, 2028 AND 2030
(Winter Weekday and Winter Weekend Days)

September 2015
Utah Division of Air Quality
Planning Branch/Mobile Sources

3.e.ii) ON-ROAD MOBILE SOURCES PM10 EMISSIONS INVENTORIES

LIST OF TABLES

ii. Overview

The purpose of this document is to explain how the EPA emissions model MOVES2014 (March 2015 version), “Motor Vehicle Emission Simulator” and AP-42 Chapter 13.2 were used to create the PM_{10} SIP on-road mobile source base year (2011) and projection years (2019, 2024, 2028 and 2030) motor vehicle emissions inventories.

The "baseline inventory" covered winter weekdays and weekend days in 2011 based on temperatures recorded during the coldest PM_{10} episode which took place from Wednesday, December 7, 2009 through Saturday, January 23, 2010 inclusive.

The baseline inventory covers the PM_{10} SIP domain--the four largest urban counties along the Wasatch Front in Utah (Davis, Salt Lake, Utah and Weber Counties).

These counties fall under the jurisdiction of a Metropolitan Planning Organization (MPO). Davis, Salt Lake and Weber Counties were modeled by Wasatch Front Regional Council (WFRC). Utah County was modeled by Mountainlands Association of Governments (MAG).

Projection-year inventories were created for the four largest urban counties using the same method used to create the base-year inventory. Emissions units for the baseline and projection-year inventories were tons per winter weekday and tons per winter weekend day.

Thirteen counties that surround the PM_{10} non-attainment area used inventories from the 2011 NEI. (4) These counties include: Box Elder, Cache, Carbon, Duchesne, Emery, Juab, Millard, Morgan, Rich, Sanpete, Summit, Tooele and Wasatch.

EPA guidance requires that states create a mobile source inventory that uses the most recent available data for fleet characterization, transportation/traffic conditions, fuel parameters and meteorological data. Model development relied primarily on interagency consultation procedures to ensure the best mix of local and default MOVES2014 inputs.

Model development included discussions on the following topics: MOVES default database scale modifications, run specifications selections, County Data Manager input development utilizing local and default data, and output selection for air dispersion modeling. The following agencies provided MOVES modeling development through the interagency consultation procedures.

- EPA Office of Transportation and Air Quality: MOVES Team (OTAQ)
- Utah Department of Transportation Systems Planning & Programming: Traffic Analysis (UDOT)
- Utah Division of Air Quality (UDAQ)
- Utah Division of Motor Vehicles (UDMV)
- Mountainland Association of Governments (MAG)
- Wasatch Front Regional Council (WFRC)

iii. MOVES Modeling Procedure

The discussion below identifies the procedures followed to model the baseline and projection year inventories.

1. MOVES Default Database Scale Modifications: Daily VMT and Local Roads

(a) Daily VMT

The daily scale modification allows the MOVES model to apply daily VMT as an input. The MOVES default database requires the user to convert annual VMT to daily VMT. The modifications allow for a simplified approach to developing VMT inputs by eliminating the confusing process of creating annual VMT.

Modifications to Daily Tables

Table Names	Data Columns	Description of Changes
dayofanyweek	noOfRealDays	Weekday number of real days changed from 5 to 7; weekend day number of real days changed from 2 to 7.
dayvmtfraction	dayVMTFraction	set to 1.
monthofanyyear	noOfDays	
monthVMTfraction	monthVMTfraction	

(b) Local Roads

The local road scale modification allows the MOVES model to apply separate local road conditions. The MOVES default database combines input parameters for arterial and local roads into a single road category. The modifications allows for a simplified approach to developing local road conditions by eliminating the process of creating a new road type.

Modifications to Local Road Tables

Table Names	Data Columns	Description of Changes
avgspeeddistribution	roadTypeID	Road types rural local(32) and urban local(52) added.
drivescheduleassoc	avgSpeedBinID	
hourvmtfraction	driveScheduleID	
roadtype	hourVMTFraction	
roadtypedist	roadDesc	
zoneroadtype	roadTypeVMTFraction	
	SHOAllocFactor	

2. MOVES2014 Interface

(a) Run Specification Selections

Description: User can add notes and comments to identify run

Scale: County scale is required for SIP-level inventories

Time Spans: Choose year, months, days and hours

Geographic Bound: County Data Manager to input transportation data statistics

Vehicles/Equipment: On-road Vehicle Equipment Fuel/Vehicle Types

Road Types: Urban Freeways, Arterials and Local Roads

Pollutants:

- Ammonia (NH_3)
- Carbon Monoxide(CO)
- Nitrogen Oxide(NO)
- Oxides of Nitrogen (NOx)
- Primary Exhaust PM_{10} & 2.5
- PM_{10} & 2.5 (Elemental Carbon, Organic Carbon, Sulfate Particulate)
- Sulfur Dioxide (SO_2)
- Primary PM_{10} & $_{2.5}$
- Non-methane Hydrocarbons
- Total Energy
- Total Gaseous Hydrocarbons
- Volatile Organic Compounds

Output: County by day organized by On-Road Source Classification Codes

The MOVES run specification selections are saved as input text files with a file name extension of ".mrs".

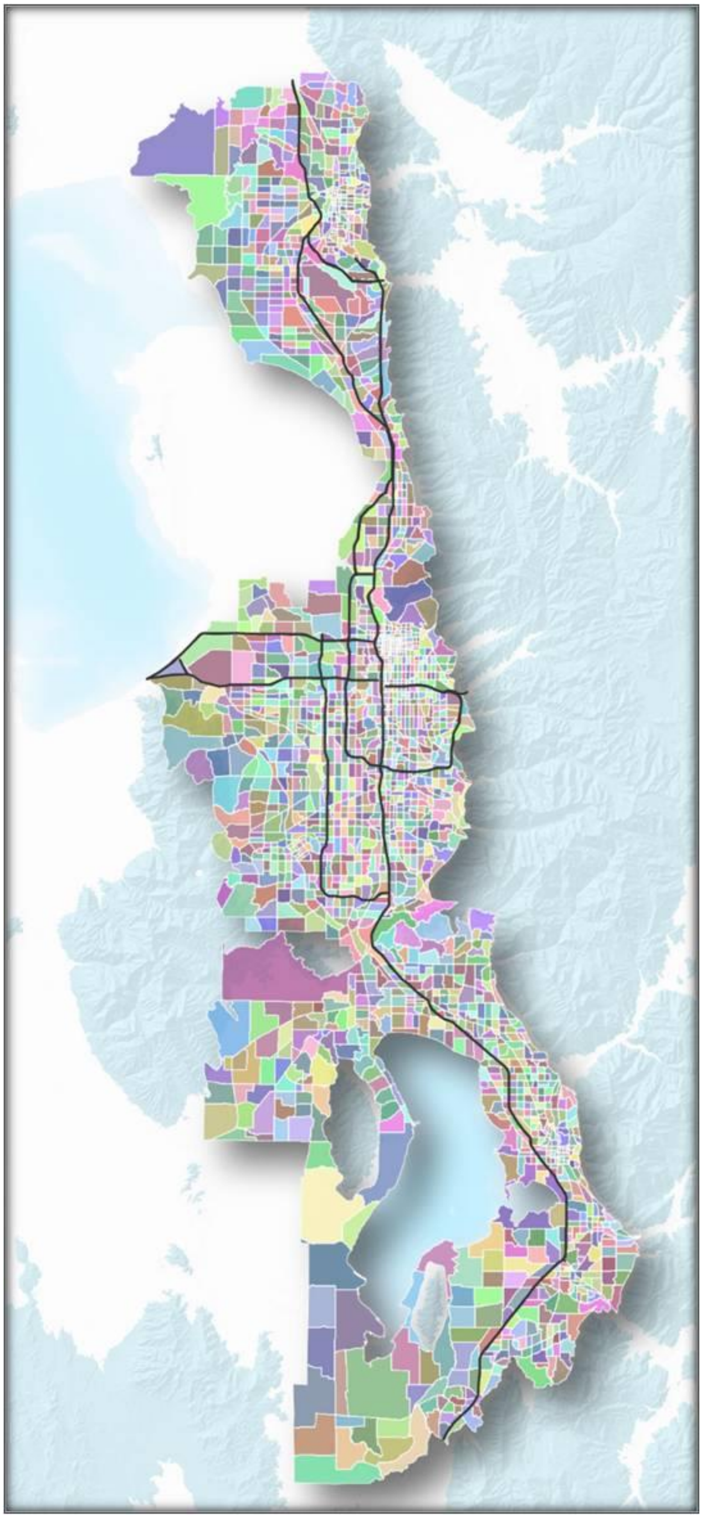
3. MOVES2014 Input Development (5, 6)

(a) County Data Manager Development

MOVES organizes data inputs into databases called County Data Manager (CDM) tables. CDMs were developed for each of the four counties in the domain for each modeled calendar year. Data for the CDMs discussed below were developed together by UDAQ and the MPOs. The MPOs rely upon the integrated regional travel demand model to develop average speed distributions and VMT by source types.

The WASATCH FRONT Integrated Regional Travel Demand Model

MODEL GEOGRAPHY & TAZ STRUCTURE MAP



The WFRC/MAG model is an integrated land-use, transportation, and air quality model designed to perform a wide range of analyses. The model includes several advanced features that place it on the cutting edge of improved modeling methods required to meet the needs MAP 21 and the Clean Air Act Amendments. In addition, several features recommended by the Travel Model Improvement Program of the US Department of Transportation, the Federal Highway Administration (FHWA), the Federal Transit Administration (FTA) and the Environmental Protection Agency (EPA) are incorporated into the model.

The MPOs employ a state of the practice travel demand model using the traditional four step travel demand process. The model is run using the TP+ program developed by the Urban Analysis Group. In the past, three similar but distinct travel models were used for the Ogden, Salt Lake, and Provo/Orem areas. These models have now been consolidated into one regional model. This improves the ability of the model to account for the effects of each area on the others since interregional trips are no longer considered "external" to any of the regions.

Some of the most useful model outputs include:

- Origin-Destination flows,
- Directional link vehicle volumes,
- Vehicular travel times and speeds, and
- Transit ridership numbers.
- The model produces forecasts for four times of day:
- AM Peak: 6-8:59 AM
- Midday: 9 AM – 2:59 PM
- PM Peak: 3-5:59 PM
- Evening/Off-peak: 6 PM – 5:59 AM

(1) Average Speed Distribution

The MPOs use data from the integrated travel demand model to prepare the average speed distribution data required for running the MOVES model. For the urbanized planning area, all VMT reported in the travel demand model is reported “urban” VMT.

WFRC has prepared a travel model program, named TDM2MOVES, to generate the vehicle activity input files required for running the MOVES model. This program does not distinguish speed variations by season as this detail is beyond the scope of the travel demand model. The travel demand model is calibrated to samples of actual highway speed data. The resulting speed profiles are treated as representative of actual travel speeds without further post-model adjustments for vehicle speeds.

The WFRC travel demand model was developed for the years 2011, 2019, 2024, and 2034. To prepare MOVES input files for SIP analysis years 2011, 2019, 2024, 2028 and 2030, it was necessary to use data files for speed distribution, road type distribution, and ramp percentage from the modeled year closest to the desired SIP analysis year.

MAG ran the travel demand model for the years 2011, 2016 2020 2025 and 2030. To prepare MOVES input files for SIP analysis years 2011, 2019, 2024, 2028 and 2030, it was necessary to use average speed distribution files from the modeled year closest to the desired SIP analysis year.

(2) AVFT (Diesel and Gasoline Fractions)

MOVES2014 includes a national default AVFT file that contains default fuel engine fractions for gasoline, diesel, and CNG vehicles by model year.

(3) Fuel Formulation, Fuel Supply and Fuel Usage Fraction

The baseline inventory for 2011 utilized MOVES default fuel parameters. Fuel parameters were modified for projection inventories of 2019, 2024, 2028, and 2030 to reflect local fuel conditions of 30-ppm sulfur content for E10 and E15 gasoline. The following modifications were made to the fuelsupply table.

2019: replaced fuel formulation ids 3780, 3782 with 3393 and 3395
2024: replaced fuel formulation ids 4425, 4427 with 3393 and 3395
2028: replaced fuel formulation ids 4941, 4943 with 3393 and 3395
2030: replaced fuel formulation ids 5195, 5201 with 3393 and 3395

(4) HourVMTFraction

MOVES2014 hourvmtfraction national default values were used.

(5) HPMSvTypeYear (VMT by Source Type)

MAG and WFRC developed data for HPMSvTypeYear (vehicle miles of travel). VMT profiles for years not defined in the Travel Demand Model were interpolated. Latest planning assumptions and reasonable growth factors were included in these VMT estimates

MAG and WFRC condensed the above six road types to include, for the MPO counties, only three road types:

1. Urban Interstate/Freeway
2. Urban Arterials
3. Urban Local Roads

MPOs used the integrated Travel Demand Model (TDM) to obtain modeled HPMS VMT for the base year and projection years.

Next, modeled VMT was adjusted to match HPMS volumes reported for each county in 2011. The resulting 2011 HPMS factor is then applied to future modeled/interpolated VMT to produce Adjusted HPMS VMT.

AADT VMT was converted to Average Weekday Traffic (AWKDT) and Average Weekend Day Traffic (AWKNDT) using conversion factors obtained by the respective TDMs operated by the MPOs.

Lastly, winter (January) VMT conversion factors were supplied by UDOT or obtained from the TDMs.

Winter average weekday traffic (Win AWKDT) and winter average weekend day traffic (Win AWKNDT) is found in the MOVES output files for each respective calendar year in the same way as for the base year VMT described above.

(6) I/M Coverage: Davis, Salt Lake, Utah, and Weber Counties (8)

UDAQ constructed I/M Program coverages in consultation with the local county health departments in Davis, Salt Lake, Utah, and Weber Counties.

Summary of the I/M Programs for Davis, Salt Lake, Utah, and Weber Counties

Year	Vehicle Type	Beg Model Year	End Model Year	Frequency	I/M Test	Weight
2011	Cars & Trucks	1968	1995	Annual	TSI	8,500
2011	Cars & Trucks	1996	2005	Annual	OBD	8,500
2011	Cars & Trucks	2006	2011	Biennial	OBD	8,500
2019	Cars & Trucks	1968	1995	Annual	TSI	8,500
2019	Cars	1996	2013	Annual	OBD	8,500
2019	Cars	2014	2017	Biennial	OBD	8,500
2019	Trucks	1996	2007	Annual	OBD	8,500
2019	Trucks	2008	2013	Annual	OBD	10,000
2019	Trucks	2014	2017	Biennial	OBD	10,000
2024	Cars & Trucks	1968	1995	Annual	TSI	8,500
2024	Cars	1996	2018	Annual	OBD	8,500
2024	Cars	2019	2022	Biennial	OBD	8,500
2024	Trucks	1996	2007	Annual	OBD	8,500
2024	Trucks	2008	2018	Annual	OBD	10,000
2024	Trucks	2019	2022	Biennial	OBD	10,000
2028	Cars & Trucks	1968	1995	Annual	TSI	8,500
2028	Cars	1996	2022	Annual	OBD	8,500
2028	Cars	2023	2026	Biennial	OBD	8,500
2028	Trucks	1996	2007	Annual	OBD	8,500
2028	Trucks	2008	2022	Annual	OBD	10,000
2028	Trucks	2023	2026	Biennial	OBD	10,000
2030	Cars & Trucks	1968	1995	Annual	TSI	8,500
2030	Cars	1996	2024	Annual	OBD	8,500
2030	Cars	2025	2028	Biennial	OBD	8,500
2030	Trucks	1996	2007	Annual	OBD	8,500
2030	Trucks	2008	2024	Annual	OBD	10,000
2030	Trucks	2025	2028	Biennial	OBD	10,000

Summary of additional I/M Program coverage test procedures.

County	Beg Model Year	End Model Year	I/M Test	Weight
Salt Lake	1968	1995	ASM (Only calendar Year 2011)	8,500
Davis	1990	1995	Gas Cap Pressure Test	8,500
Salt Lake	1968	1995	Gas Cap Pressure Test	8,500
Weber	1968	1995	Gas Cap Pressure Test	8,500

(7) Road Type (Ramp Fractions)

The integrated Regional Travel Demand Model also provides ramp fraction data required for running the MOVES model. The ramp fraction is calculated as:

Ramp Fraction = rampVHT / (rampVHT + freewayVHT)

where VHT represents vehicle hours traveled.

(8) Road Type Distribution

The integrated TDM provides the necessary file input for the urban road type distribution in the respective non-attainment areas.

UDOT HPMS VMT was organized by UDAQ according to the following MOVES road type ID's:

Modified MOVES Road Type IDs	UDOT HPMS Categories
Rural Restricted 2 (Interstate and Fwy)	Rural Interstate (01) Rural Other Principal Arterial (02)
Rural Unrestricted 3 (Arterial)	Rural Major Collector (07) Rural Minor Collector (08) Rural Minor Arterial (06)
Urban Restricted (Interstate and Fwy) 4	Urban Interstate (11) Urban Freeway and Expressway (12)
Urban Unrestricted 5	Urban Other Principal Arterial (14) Urban Minor Arterial (16) Urban Collector (17)
Rural Local 32	Rural Local (09)
Urban Local 52	Urban Local (19)

(9) Source Type Age Distribution

MAG and WFRC developed source type age distributions using Utah Department of Motor Vehicle registration data by county for the year 2011.

Utah DMV data was used to determine the age profile of motorcycles, passenger cars, and light duty trucks, all of which are registered in the State. These vehicles correspond to the MOVES vehicle types 11, 21, 31, and 32. Heavy duty and commercial vehicles (MOVES types 41-62) are not well represented in the Utah DMV data because these vehicles if registered in the State may accumulate much of their activity outside the State, or these types of vehicles active in the State may actually be registered in other States and are thus not represented in the Utah DMV data. Thus, for MOVES vehicle types 41-62, the default MOVES age distribution was used.

(10) SourceTypeYear (Vehicle Population)

MAG and WFRC developed source type populations based on the ratio between 2011 DMV data for the number of registered vehicles by county and 2011 estimated population by county. This ratio was applied to future population projections to estimate future vehicle population in a manner that maintains the 2011 vehicle to population proportions by county.

(11) ZoneMonthHour (Meteorological Data)

EPA Region 8 and UDAQ concurred that the temperature profile for each of the four counties in the domain from the PM_{10} SIP would be based on the $PM_{2.5}$ episode that ran from Monday, December 7, 2009 through Saturday, January 23, 2010. UDAQ developed the meteorological data specific to each county in the domain from the "MESOWEST" Utah website (9). Meteorological data is identified in the Zone Month Hour table. This data consists of hourly temperature (ºF) and relative humidity values (%) for each separate county and episode day.

Computation of average values can best be explained by an example for Salt Lake County:

Beginning with December 7, 2009 and ending with January 23, 2010 for the first hour (1:00), temperature and RH values were recorded as follows:

County	FIPs	Episode Day of Week	Date	Hour	T(F)	RH (%)
Salt Lake	49035	Wed	12-07-09	1:00	19.8	46
Salt Lake	49035	Thu	12-08-09	1:00	19.9	83
" "	49035	Fri	12-09-09	1:00	10.4	63
"	49035	Sat	12-10-09	1:00	10.4	66
"	"	Sun	12-11-09	1:00	9.7	75

"	"	etc				
	....					
…						
	"	Tue	01-19-10	1:00	37.2	81
"	"	Wed	01-20-10	1:00	36.3	61
"	"	Thu	01-21-10	1:00	35.1	82
"	"	Fri	01-22-10	1:00	40.1	66
"	"	Sat	01-23-10	1:00	32.7	86
"	"	AVERAGE	48 Days	1:00		

Average values for the first hour (1:00) are entered into the data set for the final episode average T and RH for the first hour.

For the *second* hour (2:00), data was collected the same way--the 48 daily values for the 2:00 hour were gathered and averaged. The process was repeated to calculate subsequent hourly averages for hours 3:00 through 24:00. The result consists of 48 average hourly values: 24 average hourly temperature values and 24 average hourly RH values.

The final data set contains 24 *hourly average temperatures* and 24 *hourly average RH* values.

iv. Fugitive Dust Procedure

1. Fugitive Dust Emissions

(a) method

PM_{10} and $PM_{2.5}$ fugitive dust emissions from paved roads ("re-entrained road dust") is not modeled by MOVES. Instead, the method from AP-42, Chapter 13, was used.

AP-42, Chapter 13.2, "Introduction to Fugitive Dust Sources", Section 13.2.1, "Paved Roads", has been revised since the November 2006 version. The new final version dated January 2011 was announced in the Federal Register on February 4, 2011.

UDAQ modeled fugitive dust from paved roads using the final January 2011 version.

(b) Calculation

(1) Constants k and Average Vehicle Weight

Inputs are somewhat different between the models. Inputs common to both methods include the following:

Name of Input	Description	Detail	New Values
(1) Constants k for PM_{10} and $PM_{2.5}$ multiplier			1.0, 0.25 for PM_{10} and $PM_{2.5}$ respectively

(2) Average Vehicle Weight	tons	Interstate	var.	var.
	Arterial	var.	var.	
		Local	var.	var.
*				

*In general, average vehicle weight is highest on interstates and lowest on local roads. In rural counties, average vehicle weight is often a factor of three or four times higher than in large urban counties due to the relatively higher percentage of large trucks in rural areas compared to urban areas with large volumes of commuter traffic.

(2) Silt Loading Factors (SLF)

UDAQ, after discussions with the Interagency Consultation Team, used the recently approved methodology in the latest version of AP-42, Ch. 13.2.1 published in the FR January 2011. EPA default silt loading factors (SLF's) were used. The Team determined that the SLF's from an old local study on silt loading conducted in Salt Lake County were of questionable accuracy. (10)

The EPA default SLF's are shown below, copied from Table 13.2.1-2 of the January 2011 guidance in AP-42:

ADT Category	< 500	500-5,000	5,000-10,000	> 10,000	
Ubiquitous Baseline (g/m2)	0.6	0.2	0.06	0.03	0.015 limited access

Note that the inventories of fugitive dust from paved roads are in units of **tons per year** as requested by UDAQ Technical Analysis Section.

(3) Precipitation

Precipitation inputs were obtained from the UDAQ Technical Analysis Section. Units are "number of hours per day with precipitation greater than 0.01 inch". As precipitation increases, fugitive dust decreases. The precipitation factor (1 - 1.2P/N) is less than or equal to 0 whenever the value of P is 20 or more (hours out of 24). In this case, the EF for dust equals zero. For P = 0, the EF is maximum.

v. Summary of Base Year (2011) and Projection Year (2019, 2024, 2028 and 2030) Inventories

PM10 SIP On-road Mobile Sources Inventory for 5 Counties in Domain

2011 Winter Weekday Emissions (Tons per Winter Weekday)

County	NH3	NOx	PM10 (Ex,Br,Ti)	PM10 Dust	Total PM10*	PM25 (Ex, Br, Ti)	PM25 Dust	Total PM25	SO2	VOC**	Distance
Davis	0.33	16.99	1.33	1.52	2.85	0.83	0.38	1.21	0.08	10.66	7,022,870
Salt Lake	1.14	57.96	4.84	6.11	10.95	2.91	1.53	4.44	0.28	35.35	25,647,496
Weber	0.22	12.18	0.97	1.12	2.09	0.62	0.28	0.90	0.05	8.58	4,512,620
Utah	0.49	24.64	1.83	3.07	4.90	1.08	0.77	1.85	0.13	11.89	11,625,583

PM10 SIP On-road Mobile Sources Inventory for 5 Counties in Domain

2019 Winter Weekday Emissions (Tons per Winter Weekday)

County	NH3	NOx	PM10 (Ex,Br,Ti)	PM10 Dust	Total PM10*	PM25 (Ex, Br, Ti)	PM25 Dust	Total PM25	SO2	VOC**	Distance
Davis	0.23	7.61	0.88	1.70	2.58	0.38	0.43	0.81	0.08	6.08	8,109,564
Salt Lake	0.89	25.79	3.43	7.45	10.88	1.39	1.86	3.25	0.31	21.16	31,321,700
Weber	0.17	6.68	0.73	1.34	2.07	0.34	0.33	0.67	0.06	5.26	5,459,463
Utah	0.46	13.77	1.62	4.42	6.04	0.62	1.11	1.73	0.17	6.43	16,741,385

PM10 SIP On-road Mobile Sources Inventory for 5 Counties in Domain

2024 Winter Weekday Emissions (Tons per Winter Weekday)

County	NH3	NOx	PM10 (Ex,Br,Ti)	PM10 Dust	Total PM10*	PM25 (Ex, Br, Ti)	PM25 Dust	Total PM25	SO2	VOC**	Distance
Davis	0.23	5.09	0.77	1.80	2.57	0.28	0.45	0.73	0.08	4.80	8,765,631
Salt Lake	0.89	17.16	3.21	8.07	11.28	1.02	2.02	3.04	0.29	16.63	33,976,028
Weber	0.17	4.5	0.66	1.45	2.11	0.25	0.36	0.61	0.06	4.19	5,970,705
Utah	0.48	9.01	1.51	4.86	6.37	0.44	1.21	1.65	0.16	5.22	18,416,455

PM10 SIP On-road Mobile Sources Inventory for 5 Counties in Domain

2028 Winter Weekday Emissions (Tons per Winter Weekday)

County	NH3	NOx	PM10 (Ex,Br,Ti)	PM10 Dust	Total PM10*	PM25 (Ex, Br, Ti)	PM25 Dust	Total PM25	SO2	VOC**	Distance
Davis	0.24	3.9	0.76	1.89	2.65	0.24	0.47	0.71	0.07	3.94	9,197,861
Salt Lake	0.91	13.88	3.3	8.52	11.82	0.91	2.13	3.04	0.28	13.94	36,017,394
Weber	0.17	3.12	0.61	1.56	2.17	0.19	0.39	0.58	0.05	3.42	6,391,046
Utah	0.51	7.28	1.62	5.35	6.97	0.42	1.34	1.76	0.16	4.60	20,283,257

PM10 SIP On-road Mobile Sources Inventory for 5 Counties in Domain

2030 Winter Weekday Emissions (Tons per Winter Weekday)

County	NH3	NOx	PM10 (Ex,Br,Ti)	PM10 Dust	Total PM10*	PM25 (Ex, Br, Ti)	PM25 Dust	Total PM25	SO2	VOC**	Distance
Davis	0.24	3.52	0.75	1.93	2.68	0.22	0.48	0.70	0.07	3.75	9,414,028
Salt Lake	0.93	12.59	3.30	8.77	12.07	0.86	2.19	3.05	0.28	13.34	37,038,111
Weber	0.17	2.83	0.61	1.61	2.22	0.18	0.40	0.58	0.05	3.26	6,601,220
Utah	0.54	6.81	1.74	5.92	7.66	0.41	1.48	1.89	0.16	4.54	21,266,876
Ogden City		0.70			0.71						

* Total PM10 includes direct, tire and brake wear, and dust

**VOC include refueling emissions

vi. Appendix: Base Year and Projection Year Inventories For PM_{10} SIP

On-Road Mobile Emissions Inventories
(Available upon request)

Base Year: 2011
Projection Years: 2019, 2024, 2028, 2030

On-road TSD\Input\utah_mod_movesdb20141021

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On-road TSD\Input\WFRC\PM10SIP_WEw2019_IN
On-road TSD\Input\WFRC\PM10SIP_WEw2024_IN
On-road TSD\Input\WFRC\PM10SIP_WEw2028_IN
On-road TSD\Input\WFRC\PM10SIP_WEw2030_IN

On-road TSD\Input\WFRC\pm10sip_BEw2011.mrs
On-road TSD\Input\WFRC\pm10sip_BEw2019.mrs
On-road TSD\Input\WFRC\pm10sip_BEw2024.mrs
On-road TSD\Input\WFRC\pm10sip_BEw2028.mrs
On-road TSD\Input\WFRC\pm10sip_BEw2030.mrs
On-road TSD\Input\WFRC\pm10sip_DAw2011.mrs
On-road TSD\Input\WFRC\pm10sip_DAw2019.mrs
On-road TSD\Input\WFRC\pm10sip_DAw2024.mrs
On-road TSD\Input\WFRC\pm10sip_DAw2028.mrs
On-road TSD\Input\WFRC\pm10sip_DAw2030.mrs
On-road TSD\Input\WFRC\pm10sip_SLw2011.mrs
On-road TSD\Input\WFRC\pm10sip_SLw2019.mrs
On-road TSD\Input\WFRC\pm10sip_SLw2024.mrs
On-road TSD\Input\WFRC\pm10sip_SLw2028.mrs
On-road TSD\Input\WFRC\pm10sip_SLw2030.mrs
On-road TSD\Input\WFRC\pm10sip_TOw2011.mrs
On-road TSD\Input\WFRC\pm10sip_TOw2019.mrs
On-road TSD\Input\WFRC\pm10sip_TOw2024.mrs
On-road TSD\Input\WFRC\pm10sip_TOw2028.mrs
On-road TSD\Input\WFRC\pm10sip_TOw2030.mrs
On-road TSD\Input\WFRC\pm10sip_WEw2011.mrs
On-road TSD\Input\WFRC\pm10sip_WEw2019.mrs
On-road TSD\Input\WFRC\pm10sip_WEw2024.mrs
On-road TSD\Input\WFRC\pm10sip_WEw2028.mrs
On-road TSD\Input\WFRC\pm10sip_WEw2030.mrs
On-road TSD\Input\WFRC\pm10sipEND_BEw2011.mrs
On-road TSD\Input\WFRC\pm10sipEND_BEw2019.mrs
On-road TSD\Input\WFRC\pm10sipEND_BEw2024.mrs
On-road TSD\Input\WFRC\pm10sipEND_BEw2028.mrs
On-road TSD\Input\WFRC\pm10sipEND_BEw2030.mrs
On-road TSD\Input\WFRC\pm10sipEND_DAw2011.mrs
On-road TSD\Input\WFRC\pm10sipEND_DAw2019.mrs
On-road TSD\Input\WFRC\pm10sipEND_DAw2024.mrs
On-road TSD\Input\WFRC\pm10sipEND_DAw2028.mrs
On-road TSD\Input\WFRC\pm10sipEND_DAw2030.mrs

On-road TSD\Input\WFRC\pm10sipEND_SLw2011.mrs
On-road TSD\Input\WFRC\pm10sipEND_SLw2019.mrs
On-road TSD\Input\WFRC\pm10sipEND_SLw2024.mrs
On-road TSD\Input\WFRC\pm10sipEND_SLw2028.mrs
On-road TSD\Input\WFRC\pm10sipEND_SLw2030.mrs
On-road TSD\Input\WFRC\pm10sipEND_TOw2011.mrs
On-road TSD\Input\WFRC\pm10sipEND_TOw2019.mrs
On-road TSD\Input\WFRC\pm10sipEND_TOw2024.mrs
On-road TSD\Input\WFRC\pm10sipEND_TOw2028.mrs
On-road TSD\Input\WFRC\pm10sipEND_TOw2030.mrs
On-road TSD\Input\WFRC\pm10sipEND_WEw2011.mrs
On-road TSD\Input\WFRC\pm10sipEND_WEw2019.mrs
On-road TSD\Input\WFRC\pm10sipEND_WEw2024.mrs
On-road TSD\Input\WFRC\pm10sipEND_WEw2028.mrs
On-road TSD\Input\WFRC\pm10sipEND_WEw2030.mrs

On-road TSD\Output\Dust\05-14-2015 PM10 SIP Fug Dust 4 Counties 2011
On-road TSD\Output\Dust\05-14-2015 PM10 SIP Fug Dust 4 Counties 2019
On-road TSD\Output\Dust\05-14-2015 PM10 SIP Fug Dust 4 Counties 2024
On-road TSD\Output\Dust\05-14-2015 PM10 SIP Fug Dust 4 Counties 2028
On-Road TSD\Output\Dust\05-14-2015 PM10 SIP Fug Dust 4 Counties 2030

On-road TSD\Output\MAG\2011_jan_wd_032315_output
On-road TSD\Output\MAG\2011_jan_we_032315_output
On-road TSD\Output\MAG\2019_jan_wd_032315_output
On-road TSD\Output\MAG\2019_jan_we_032315_output
On-road TSD\Output\MAG\2024_jan_wd_042015_output
On-road TSD\Output\MAG\2024_jan_we_042015_output
On-road TSD\Output\MAG\2028_uc_jan_wd_output
On-road TSD\Output\MAG\2028_uc_jan_we_output
On-road TSD\Output\MAG\2030_uc_jan_wd_output
On-road TSD\Output\MAG\2030_uc_jan_we_output

On-road TSD\Output\WFRC\pm10sip_2011_out
On-road TSD\Output\WFRC\pm10sipend__2011_out
On-road TSD\Output\WFRC\pm10sipt_2019_out
On-road TSD\Output\WFRC\pm10siptend_2019_out
On-road TSD\Output\WFRC\pm10sipt_2024_out
On-road TSD\Output\WFRC\pm10siptend_2024_out
On-road TSD\Output\WFRC\pm10sipt_2028_out
On-road TSD\Output\WFRC\pm10siptend_2028_out
On-road TSD\Output\WFRC\pm10sipt_2030_out
On-road TSD\Output\WFRC\pm10siptend_2030_out

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8. I/M Programs

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b. Salt Lake County Health Department, Environmental Health, Air Pollution Control, I/M Tech Center, 788 East Woodoak Lane (5380 South), Murray, UT 84107-6369, 385-468-4837. http://slcohealth.org/programs/airpollutioncontrol/vehicle-emissions-control.html

c. Utah County Health Department, Utah County Environment Health, Bureau of Air Quality, I/M Tech Center, 3255 North Main Street, Spanish Fork, UT, 84660, 801-851-7600. http://www.utahcounty.gov/Dept/HealthEnvirAir/

d. Weber-Morgan Health Department, Environmental Health, 477 23rd Street, 2nd floor, Ogden, UT 84401, 801,399-7160, http://www.webermorganhealth.org/environmental.php?d=4

9. MESOWEST UTAH, (met data archive), University of Utah, Department of Atmospheric Sciences, http://mesowest.utah.edu/.

On the map, click on the outline of Utah. On the upper menu (red bar), under "Product", choose "Current Weather Summary (instead of "Surface Weather Maps") and click on "GO". Then choose a station name, e.g., "Salt Lake City I" (Salt Lake City International Airport).

To find a different station, go to the menu on the left-hand side of the page. Under "MORE INFO", choose "Nearby Stations" and select a different city or station.

When screen for desired station appears, choose, on LHS menu, "Change Date/Time". Enter Units (English or metric, Time (local, not GMT), Date and Hour (0:00).

NOTE: If choosing date of, for example, June 1, 2014, enter June 2, 2014 to obtain the correct data. Temperature and relative humidity data is then displayed by hour.

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